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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/602,564 | 06/24/2003 | Gregory L. Kellogg | 95,1408-SSS | 1682 |

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EXAMINER

HANDY, DWAYNE K

ART UNIT PAPER NUMBER

1743

DATE MAILED: 01/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/602,564

Applicant(s)

KELLOGG ET AL.

Examiner

Dwayne K. Handy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6/25/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Oath/Declaration

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

Applicant has misidentified the application number in the Oath. Applicant has referred to Application No. 09/595,239 – the parent application. This is incorrect.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-7 and 9 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 3 and 9 of U.S. Patent No. 6,582,662 in view of Mian (WO 97/21090). Claims 1, 3 and 9 of ('662) ^{recite} ~~teach~~

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every element of claims 1-7 and 9 of the instant claims except for the capillary stop element. Mian teaches a microfluidic device that uses centripetal force to move fluids through its channels. Figure 1A shows an embodiment having reservoirs (12, 14, 18, 20) and reaction chambers (16, 22, 24) connected by valves (13, 15, 17, 19, 21, 23, 25). Mian teaches the valves are comprised of capillary stop mechanisms having changes in the cross sectional area of a channel on page 27, line 11 – page 28, line 10. It would have been obvious to one of ordinary skill in the art to combine the capillary valves from Mian with the device recited in ('662). One would add the capillary valves to provide fluid control as in Mian.

Inventorship

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mian et al. (WO 97/21090) in view of Kopf-Sill et al. (5,842,787). Mian teaches a microfluidic device that uses centripetal force to move fluids through its channels. Figure 1A shows reservoirs (12, 14, 18, 20), valves (13, 15, 17, 19, 21, 23, 25) and reaction chambers (16, 22, 24). Mian teaches valves comprised of capillary stop mechanisms having changes in the cross sectional area of a channel on page 27, line 11 – page 28, line 10. The Examiner considers the channels connecting the reservoirs to the reactors (these channels are unlabeled in the Figure) to be the “plurality of microchannels that join one or a plurality of capillary junctions...”. The channels that connect the reaction chambers

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(16, 22, 24) would be the mixing microchannels. Mian teaches detection reservoirs on page 31, lines 11-13. Mian **does not teach** a mixing microchannel of a specific length configured to bend a plurality of times around a plurality of curves as the mixing channels traverses a longitudinal path.

Kopf-Sill teaches a microfluidic device. The embodiment of the device most relevant to the instant claims is shown in Figure 1 and described in column 4. The microfluidic network contains two channels (106) that combine to form analysis channel (104) contains a serpentine portion (118) to extend the length of the channel without requiring substantially greater substrate area. It would have been obvious to one of ordinary skill in the art to combine the serpentine channel from Kopf-Sill with the device of Mian. One would use the bending channel portion to extend the length of the channel for mixing without requiring substantially greater substrate area. Kopf-Sill teaches multiple turns of up to 180° in column 11, lines 44-59 and mixing channel lengths in column 15, lines 32-38.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kellogg et al. (6,527,432; 6,548,788; 6,632,399), Farina et al. (6,653,122), Sheppard, Jr. et al. (6,656,430), Nelson et al. (6,074,827), Hubbard et al. (6,338,820) and Mathies et al. (6,623,613) teach circular discs having microfluidic networks. Henderson et al. (6,258,263), Sheih et al. (6,361,958), Yin et al. (6,459,080)

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and Griffiths (6,627,076) show microfluidic devices having curved or serpentine channels.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dwayne K. Handy whose telephone number is (571)-272-1259. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571)-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DKH
September 30, 2005


Jill Warden
Supervisory Patent Examiner
Technology Center 1700